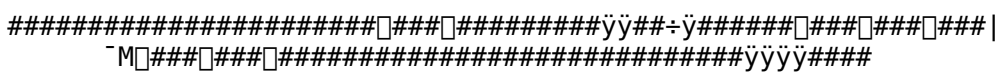

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/#ÿÿ####ÿÿ####Uÿl#ÿÿK#########d#############understand your personal type of light losslearn when to utilize the anti-G □hook□understand daily variations in relaxed G-tolerancerespect the 6 sec □buffer period□appreciate the potential □GLOC trap□understand the one-sided light loss that may occur in the check-six position

###ÿÿ#####ÿ□#ÿÿd#########d#########³###ENABLING OBJECTIVES: Upon completion of this unit the student will:1.1   Be familiar with the principal effects of negative Gz forces.1.2 Be familiar with the principle effects of positive Gz forces.1.3 Be familiar with the G-time/tolerance curve.1.4Be familiar with the various elements of anti-G protection.1.5   Be thoroughly familiar with the AGSM1.6   Be familiar with the exercises which can improve one□s +Gz tolerance.)

#################,##########################ÿ□#ÿÿd######0##d#########2##□## ÷=þ6#S#ÿÿ ###ÿÿ####Tÿl#ÿÿK######0##d#########u###Be familiar with Gz acceleration forces, the causes and symptoms of (G-LOC), and the methods to improve G-tolerance.l

##########ÿ□#ÿÿd#########d#########³###1. With new technologies allowing for greatly increased thrust-to-weight ratios and improved materials, the capability of an airframe to withstand G-loading has risen greatly.2. With each major advancement in the operating environment, flight personnel have been presented with visual problems or unconsciousness caused by acceleration stresses. This problem presents itself as an extremely critical situation, in part because of the amnesia and disorientation which frequently follows a loss of consciousness episode.3. There have been many fatal mishaps attributed to G-LOC, and safety experts believe many □pilot-error□ mishaps over the years may have really been G-LOC episodes.9

##########ÿ#ÿÿd#########d#########ü###APPROACH MAY-JUNE 1996THE AVIATORS LOST CONSCIOUSNESS FOR 2-30 SECONDS. AFTER THEY REGAINED CONSCIOUSNESS, IT USUALLY TOOK 20 SECONDS TO 4 MINUTES TO COMPLETELY RECOVER. THE TIME OF DISORIENTATION DID NOT DEPEND ON THE AMOUNT OF G EXPERIENCED OR THE LENGTH OF LOC. in ONE CASE, THE RECOVERY WAS DELAYED FOR 20 TO 25 MINUTES AFTER REGAINING CONSCIOUSNESS, AND THIS WAS FROM ONLY 4 G’S. DURING RECOVERY, THE VICTIMS COULD OFTEN HEAR BUT COULDN’T SPEAK OR MOVE.   THE MOST COMMON G-LOAD THAT TRIGGERED A GLOC WAS 3.0-3.5 Gs.   Class A Mishap information for the USAF show that eleven aircraft and 10 pilots were lost to G-Loc between 82-86. USAF Inspection survey in 83 revealed 12% of all fighter aircrews had knowingly experienced one or more G-LOC episodes.

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###ÿÿ####Uÿl#ÿÿK#########d#########|###it□s funit builds characterso you can kill the other guyso you don□t get killedactually only pull Gs to change direction

###ÿÿ#####ÿ□#ÿÿd#########d#############ACCELERATION IS DEFINED AS A TIME RATE OF CHANGE IN VELOCITY MAGNITUDE AND/OR DIRECTION.ACCELERATION MAGNITUDE IS EXPRESSED AS VELOCITY PER UNIT TIME. SUSTAINED ACCELERATION MOST SIGNIFICANTLY AFFECTS THE CIRCULATORY SYSTEM AND SECONDARILY AFFECTS MENTAL AND SENSORY FUNCTION.3 TYPES OF SUSTAINED ACCELERATION ARE: LINEAR, WHICH IS A CHANGE IN SPEED WITHOUT A CHANGE IN DIRECTION,RADIAL/CENTRIPETAL, WHICH RESULTS FROM A CHANGE IN DIRECTION WITHOUT NECESSARILY A CHANGE IN SPEED, AND ANGULAR WHICH IS ROTATION AROUND A BODY AXIS.o

###ÿÿ#####ÿ□#ÿÿd#########d#############FOR AN AVIATOR OF AVERAGE STATURE SEATED UPRIGHT, THE HEIGHT OF THE COLUMN OF BLOOD FROM THE AORTIC VALVE TO THE EYE IS ABOUT 30 CM. AT 1 +Gz, THIS COLUMN OF BLOOD WOULD RESULT IN AN APPROXIMATE PRESSURE OF 100 MMHG AT THE AORTIC VALVE LEVEL, THE SYSTOLIC BLOOD PRESSURE AT EYE LEVEL AT 1 +Gz WOULD BE 100 - 22 OR 78 MMHG. FOR EACH ADDITIONAL +Gz, THE EYE LEVEL BLOOD PRESSURE IS LOWERED BY 22 MMHG, UNTIL AT 4.5 G, THE MEAN EYE LEVEL BLOOD PRESSURE IS 0. THEREFORE , IF ONLY THE HYDROSTATIC COLUMN IS CONSIDERED, THE THEORETICAL LIMIT OF +Gz TOLERANCE FOR EYE AND BRAIN BLOOD FLOW, AND THUS EYE AND BRAIN FUNCTION IS APPROXIMATELY 4.5 G, UNLESS EITHER THE BLOOD PRESSURE AT THE AORTIC VALVE LEVEL IS INCREASED, OR THE EFFECTIVE HEIGHT OF THE AORTIC VALVE TO EYE BLOOD COLUMN IS DECREASED.

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#################,##########################ÿ□#ÿÿd#########d#########2##□##ªö
      üV    i#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########|###BP above the heartBP
below the heartblood pooling lower extremitiesCO and BV10 sec delay in reflex
Petechial hemorrhages
```

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Ï#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########□###your BP forces blood up to your brainhigh Gs force the blood down away from your head□Hook□ maneuver is designed to raise the BP and keep blood flowing up to your brainthe muscle strain keeps blood from pooling in your legs or arms, trapping it in your chest the □hook□ closes your glottis so you can strain against itthe deep breath and strain raises pressure in the chest to squeeze blood up to your head ÿ

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      üV    ï### #########T#l#      #K########d#########â###1. press-to-test G-
suit2. pull about _ Gs for at least 10 secno strain3. OPTIONAL: gradually
increase Gs without straining until you see some light lossdetermines your
relaxed G-tolerance consider it might be a low-G day
```

###ÿÿ#####ÿ#ÿÿd#########d#########Ê###no strain so get decreased BP, and stim CV reflexotherwise, if strain, maintain BP, get no effectmaintain about 10 sec in order to get full effectincrease Gs to look for relaxed G-tool for today -- if low, youll know to look outuses lots of air space and gas. Do it if you need it, and only do step 3 when you think you might be having a low-G day.dont check box it by doing it on the way to the tanker; wait until you need it, and repeat it if its been over 15-20 min. since you pulled Gseffective, in that with relaxed G-tool of, say, 5.5, adding 3/4 G would make light loss less likely, and make it so that they wouldnt have to strain so hard.straining can be hard. Economy of effort is the goal.

###ÿÿ#####ÿ#ÿÿd#########d#############AS THE +Gz LEVEL INCREASES, COMPENSATORY MECHANISMS BEGIN TO ACT. BARORECEPTORS IN THE AORTIC ARCH AD CAROTID ARTERIES SEES THE DECREASE IN PRESSURE AND ACTO TO INCREASE THE BLOOD FLOW TO THE HEAD BY THREE MECHANISMS: PERIPHERAL VASOCONSTRICTION, INCREASED HEART RATE, AND INCREASED CONTRACTILE FORCE OF THE CARDIAC MUSCLE. THESE RESPONSES OCCUR ABOUT 6-10 SECONDS AFTER STIMULATION AND IN VERY FAST ONSET RATES OF G, MAY BE TOO SLOW TO AVOID SERIOUS NEUROLOGICAL CONSEQUENCES. CHEMORECEPTORS PLAY A ROLE AS PRESSURE DROPS AND THE ARTERIAL OXYGEN PARTIAL PRESSURE DECREASES FORM THE RESPIRATORY EFFECTS OF G. THE CENTRAL NERVOUS SYSTEM (cns) ISCHEMIC RESPONSE PROBABLY PLAYS A ROLE IN RECOVERY WHEN HEAD BLOOD PRESSURE DROPS TO 0 GREATER THAN 5 SECS, RESULTING IN LOSS OF CONSCIOUSNESS. #

#################,##########################ÿ□#ÿÿd#########d#########2##□##ªö
üV   ï#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#############gives you about 3/4 G additional relaxed G- tolerance protectionbut it takes 10-15 seconds to occur might notice more light loss on first pull of the dayand lasts only about 10-15 minutesso might consider doing G-warm-up close to the time that you□ll be needing the extra helpN

#################,##########################ÿ□#ÿÿd#########d#########2##□##s÷æú□#Ì#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########p###with sustained negative Gspush over, or level inverted flightBP rises in your head and your carotid bodies compensate by:slowing your pulse, anddilating your blood vesselsthis lowers your BP in about 10-15 secbut normally + Gs come on just as your BP is falling and you can GLOC at 3Gs!So avoid +Gs after sustained -Gswon□t occur unless -Gs last over 3-4 sec.

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/#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########å###polka-dot bruises in dependent areas where there is no counter-pressurecaused by high, sustained Gsworse when you haven□t flown for awhilelike a bruise, looks worse the next day, but fades out in 3 - 5 daysare not contagious!#

wF&#########&#####2##▯##ªö¹úV ▯#ÿÿ####ÿÿ####Uÿl#ÿÿK#########d#########▯###chest tightness and feel short of breath after breathing 100% oxygenrelease one side of oxygen maskmakes you coughbut is not because the oxygen is ▯dry▯oxygen, unlike air, is absorbed from your lungs so quickly that the air cells actually collapse and stick closedworse after sustained Gsthe cough is the cure -- this re-inflates the air cells and relieves the unpleasant feeling

#################,#########################ÿ□#ÿÿd#########d#########2##□##ªöIûV
/#ÿÿ####ÿÿ####Uÿl#ÿÿK#########d#########E###may feel like you can□t get enough air indue to physical forces compressing your chestbreathing is usually rather easy -- this isn□tyou just have to work at ithypoxia may contribute to decrease in performance, or increased likelihood of GLOC or ALOCbe efficient -- another reason not to work any harder than you have to!n

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      üV    ï#ÿÿ ###ÿÿ####Uÿô#ÿÿK#########d#########O### in retinal circulation
in retinal perfusiongrayout or blackout visual fieldr
```

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ûf#□#ÿÿ ###ÿÿ####Tÿl#ÿÿK#########d#########□###1. tunnel vision ==> in-from-the-
sides 2. □dimmer switch effect□3. splotches4. curtain5. combination/variations
over time.Vision loss may be asymmetric.#
```

###ÿÿ#####ÿ□#ÿÿd#########d#########□###FIRST, BLOOD FLOW TO THE EYE CEASES BEFORE BLOOD FLOW TO THE BRAIN DOES, BECAUSE OF THE INTERNAL PRESSURE OF THE EYE (APPROXIMATELY 16 MMHG AVERAGE). BECAUSE OF THIS EARLY BLOOD LOSS DIFFERENCE, VISION WILL FAIL AT ABOUT .7 G BELOW THE +Gz LEVEL AT WHICH CEREBRAL FUNCTION FAILS. THIS IS FORTUITOUS FOR THE AVIATORS SINCE IT CAN PROVIDE A VISUAL WARNING OF IMPENDING LOSS OF CONSCIOUSNESS.#

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      □#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########õ###when check-6, normally
inadvertently tilt our head a little, so one eye becomes higher than othertop
eye loses light before lower eyebut we tend to □use the good eye□ and ignore the
light lossthe light loss in the top eye is the GLOC warning!z
```

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#################,##########################ÿ□#ÿÿd#########d#########2##□##ªöyûV
      _#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#############head tilt during a turn is
misunderstood by the body, which thinks your head has tilted more than it really
hasbut since you know where your head is, you think that the plane experienced
an uncommanded pitch-upwatch out during a sustained turndon□t go by your
instruments!l
```

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      ï#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########ª###your brain functions normally
without any blood flow for about 6 seconds, then simply shuts down!probably a
self-protective mechanismanswer to today□s quiz question is:
```

##########ÿ#ÿÿd#########d#########¦###NEUROLOGICAL EFFECTS. mOST OF THE CNS AND SENSORY EFFECTS OF +Gz ARE A DIRECT RESULT OF THE CARDIOVASCULAR EFFECTS. FOR CNS AND EYE TISSUE TO FUNCTION ONLY BRIEF BLOOD FLOW INTERRUPTION CAN BE TOLERATE. IF BLOOD FLOW TO THESE TISSUES IS INTERRUPTED, THE TISSUE RESERVES OF OXYGEN LAST APPROXIMATELY 5 SECONDS. AS THIS MINUSCULE RESERVE IS USED UP, THE TISSUE CEASES ITS NORMAL FUNCTION. if BLOOD FLOW IS RESTORED AFTER A BRIEF PERIOD OF MALFUNCTION, THE TISSUE RESUMES FUNCTIONING WITH NO RESIDUAL DAMAGE. THERE IS HOWEVER, A PROFOUND AND CRITICAL DIFFERENCE BETWEEN THE RESPONSE OF THE EYE AND THE RESPONSE OF THE BRAIN TO BLOOD FLOW LOSS FROM +Gz.Oxygen reserve capacity is described as:a. The eyes and brain have approximately a five second oxygen reserve after blood flow ceases following rapid onset, sustained, high +Gz exposure.b. A short duration of +Gz load less than five seconds can be applied with no symptoms.

###ÿÿ#####ÿ□#ÿÿd#########d#########ó###NOTE ESPECIALLY THE 5-SECOND OXYGEN RESERVE DURING WHICH NO EYE OR BRAIN SYMPTOMS OCCUR. THIS RESERVE EXPLAINS WHY AN AVIATOR CAN BEND AN AIRPLANE WITH MOMENTARY EXCESSIVE G, HAVE NO ILL EFFECTS, AND AS A RESULT, DEVELOP AN INFLATED PERCEPTION HIS G TOLERANCE.THE DIP IN THE CURVE ILLUSTRATES THE PROBLEM CAUSED BY THE LAG IN PHYSIOLOGICAL COMPENSATORY MECHANISMS, ESPECIALLY WITH HIGH ONSET RATES OF G. THE GRAY AREA IS WHERE YOU□LL HAVE THE G-SYMPTOMS THAT PILOTS CAN USE EFFECTIVELY WITH SLOW ONSET RATES OF G. IT ALSO ILLUSTRATES WHY THIS STRATEGY WILL NOT ALWAYS WORK WITH AIRCRAFT THAT ARE CAPABLE OF HIGH ONSET RATES OF G. THERE IS SIMPLY OT ENOUGH TIME FOR THE VISUAL SYMPTOMS TO PROVIDE WARNING BEFORE G-INDUCED LOSS OF CONSCIOUSNESS (GLOC).s

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###2##□##j÷-ü□###ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########z###get in habit of
waiting for light loss before we start to strainbut may have no light loss
warning before GLOC above 6 Gs
```

##########ÿ□#ÿÿd#########d#########ù###ANOTHER PROFOUND DIFFERENCE BETWEEN EYE AND BRAIN RESPONSE TO +Gz IS THE FAILURE AND RECOVERY MODE. the EYE FAILS AND RECOVERS SMOOTHLY WHEN BLOOD FLOW STOPS. THIS CAN BE EASILY DEMONSTRATED BY DIGITAL PRESSURE ON THE EYE TO STOP THE BLOOD FLOW. AFTER ABOUT 5 SECONDS OF PRESSURE, VISION IS PROGRESSIVELY LOST FROM PERIPHERAL VISION TO CENTRAL VISION . WHEN BLOOD FLOW IS ALLOWED TO RESUME, VISION IS SMOOTHLY AND RAPIDLY RECOVERED. CEREBRAL FAILURE AND RECOVERY IS MUCH LESS GRACEFUL AND PREDICTABLEV

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#ó#ÿÿ####ÿÿ#####ÿ#ÿÿd#########d#########ê###Cognitive changes -- error making
some fatigue related, some ALOCALOC -- Almost GLOCimpairment but not LOC
typical almost lost it scenarioGLOC -- G induced loss of consciousnessLOC is
all-or-none, butG effects are a continuum

###ÿÿ#####ÿ□#ÿÿd#########d#########ý###used to be: normal/blackout /GLOCnow understood to be continuum:normal -- grayout -- blackout -- ALOC -- GLOCloss of SA may be symptom of ALOC and not just a dumb aviatorlook at the flight profile -- high sustained Gs over 6 seconds? Consider ALOC.A

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#³#ÿÿ####ÿÿ####Uÿl#ÿÿA#########d#########
###G-induced loss of consciousness1. Absolute Incapacitation Periodclassic LOC
-- out coldvaries 1-18 sec, mean 12 sectypical in-flight GLOC is short: 1-6 sec
as pilot lets go of the stick, plane goes to 1Gflailing is commonblood flow
returns in watershed pattern
```

##########ÿ□#ÿÿd#########d#########]###staged recovery probably due to the watershed effectdo not be fooled by those who say □GLOC lasts 12 seconds□. They are making the MEAN of a RANGE the absolute single fact. GLOC lasts anywhere from 15-18 seconds (rarely that long in aircraft environment where, when pilot lets go of the stick, the Gs come off) to a fraction of a second. Remember -- a continuum normal -- ALOC -- GLOCAFTER ABOUT 5 SECONDS OF BLOOD FLOW STOPPAGE TO THE BRAIN, GLOC OCCURS SUDDENLY AND LASTS FORM 10 -30 SECS (AVERAGE 13 SECONDS). WHEN CONSCIOUSNESS IS REGAINED, IT IS USUALLY ACCOMPANIED BY BRIEF SEIZURE-LIKE ACTIVITY AD A PERIOD OF CONFUSION WHICH LASTS ABOUT 12 SECONDS. DURING THIS 12 SECONDS, THE AVIATOR IS UNABLE TO FUNCTION EFFECTIVELY. AN ADDITIONAL PERIOD OF UP TO 2 MINUTES IS REQUIRED BEFORE COGNITIVE AND PSYCHOMOTOR PERFORMANCE ABILITY RECOVERS TO NORMAL.#

###2. Relative Incapacitation Period1-24 sec additionallights are on, but no one is homesubject is upright, looks OK, butincapable of thinking or responding terminates abruptly with reintegration of mental functions and return to near normal capabilitiesmay lose SA

###ÿÿ#####ÿ□#ÿÿd#########d######### ###recovery is again like Windows -- turn it on, it still takes a moment to □wake up□; but once there, you□re normal.Total Incapacitationcombination of absolute and relative incapacitationtotals 1-25 sec when NO ONE IS IN CONTROL of the planelet□s see, at 450 knots for 20 seconds ...

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û□#³#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########å###have some tingling or numbness
have some twitching or jerkinghave a pleasant dreamnot realize that you GLOCed!
be a little confused or disorientedbe aware that you have lost your hearingfeel
a little □off□ the rest of the day

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üV ï#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########s###before we can answer, we must understand the terms:Relaxed G-toleranceEndurance G-toleranceStraining G-tolerance4

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      üV   i#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########□###the G level at which you
have significant light loss without doing a straining maneuver. relates to
heart-to-eye distancebody shapeseat-back angle

#####$##########################ÿ□###d#########Z#########2##□##ªöyûV   _#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########µ###variesfrom person to personfrom day to daysame for women and men4 to 6 Gs for most peopleobviously different with or without an anti-G suitdoes not relate to physical training#

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#,###############,###########(#########(####ÿ□#ÿÿd#########d#########2##□##ªö
      üV   ï#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########¿###tilt-back seatlowers shortens heart-to-eye distanceless than 1G improvement seen in F-16anti-G suit onset delayed until after the Gs come onrecent G exposure --
            the □training effect□e

#####,##########################ÿ□#ÿÿd#########d#########2##□##³ö¶úß#□#ÿÿ
###ÿÿ####Uÿl#ÿÿK#########d#########ü###the highest G-level you can stand when doing your best straining maneuverbut is hard to measure and studydoes relate to physical strength, and is improved by working outphysical training improves your ability to repeatedly strain without wearing out

#####,##########################ÿ□#ÿÿd#########d#########2##□##C÷□úo#l#ÿÿ
###ÿÿ####Uÿl#ÿÿK#########d#########¹###the time you can keep straining against varying G levels until you are exhaustedhard to measure, hence hard to use reliably in researchimproved by both aerobic and anaerobic training!#

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_#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########î###was once thought to decrease your relaxed G-tolerance; probably not trueaerobic training actually improves your □staying power□ by allowing rapid recovery from the strainingavoid extreme training -- keep your resting heart rate above 45

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#################,##########################ÿ□#ÿÿd#########d#########2##□##ªö9üV
      ##ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########□###does not affect your relaxed
G-tolerancedoes improve your strength and endurance G-tolerancepays off on long,
difficult engagements, and on frequent flights
```

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üV   ï#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########ó###So, train the muscles you strainyour goal is sustained, repeated straining with rapid recoveryinclude aerobic trainingmy personal view is that you are better served by understanding Gs, and doing what you have to effectively and efficiently#

###############,########################ÿ#ÿÿd#########d#########2####ªö#ûV
ÿ#ÿÿ ###ÿÿ####Tÿl#ÿÿK#########d#############neck pain is #1 cause of down time for high-G aviatorsmovement under Gshelmet, mask, NVGs, etc.Great Benefits come with neck strength better control (dont want to kiss your belly button!) less likely to be injuredso, include neck strength training in your weight workout!r

#################,##########################ÿ□#ÿÿd#########d#####2###2##□##ªöIûV /#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#############leading cause of down time for high-G aviatorsassociated with high rate of G onset (□snatching on the Gs□)

non-pilot can□t anticipate G onsethead movement under Gsadditional head mounted equipmentgood neck strength training minimizes injury potential□

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      ï#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########f###Training EffectG-tolerance
increases when you fly GsLayoff Effectand drops off again when you don□t
```

#################,##########################ÿ□#ÿÿd#########d#########2##□##ªö#ûV
ÿ#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########:###

relaxed G-tolerance will increase all by itself with frequent exposure to Gsit□s not flight time, but □G-time□can increase up to 2 Gs within a weeksay usual relaxed G-tolerance is 5; G-suit makes it 6. So training effect can push it up to 8! You don□t ever have to strain.You get used to not having to strain

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      ¿#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#########%###tilt back seat (30 deg tilt)
gives < 1 G additional relaxed tolerancestandard seat is 13 deg; this raises
your head and lets you see out betteranti-G suitalways lags the G onsetstart
your muscle strain before the Gs come on -- esp before high Gsgives a 1G
increase in relaxed G-toleranceo

###ÿÿ#####ÿ□#ÿÿd#########d#########□###ANTI-G SUIT: CONTAINS INFLATABLE BLADDERS, WHICH CAUSE CONSTRICTION AROUND THE CALVES, THIGHS AND ABDOMEN. THE SUIT PREVENTS POOLING OF BLOOD IN THE LOWER EXTREMITIES AND ABDOMEN, THUS IMPROVING VENOUS RETURN TO THE HEART, AND ELEVATED THE DIAPHRAGM, THUS SLIGHTLY REDUCING THE AORTIC VALVE TO EYE COLUMN HEIGHT, REDUCING THE DISTORTION OF THE HEART BY G, AND ASSISTING IN INCREASING THE NINTRATHORACIC PRESSURE. THE SUIT IS INFLATED BY AN AIRCRAFT-MOUNTED G VALVE, WHICH SENSE G AND INFLATES THE G SUIT IN PROPORTION TO THE G FORCE. CAREFUL FITTING OF THE G SUIT IS RITUAL TO ITS FUNCTION. A WELL-FITTED G SUIT WILL INCREASE G TOLERANCE BY ABOUT 1 G.

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/#ÿÿ ###ÿÿ####Uÿl#ÿÿK#########d#########ø###positive pressure breathing with chest jerkin and Eagle anti-G suitcan sustain 8 Gs without straining!can keep talking and breathing throughout high Gsso increases your endurance tooless trainingbetter breathinghigh Gs still suck, though....

```
#################,##########################ÿ□#ÿÿd#########d#########2##□##ªö#ûV
      ÿ#ÿÿ####ÿÿ####Uÿl#ÿÿK#########d#########=###G-suit helps you by doing some
of the workstrain first, then slack off  after the G-suit fillsfit should be
snug, not tighttoo loose just takes longer to fill upwhile standing, should
easily slip:two fingers down by the thigh and calf, andopen hand down the front
release G-suit when you need to (spring, fall)i
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#################,##########################ÿ□#ÿÿd#########d#########2##□##ªöéúV
      Ï#ÿÿ####ÿÿ#####ÿ□#ÿÿd#########d#############M-1 classic gruntL-1 glottis
closed completely□Hook□ maneuverI say it□s OK to use your own combination of leg
strain/abdominal strain/hook maneuver as you need to.Do what you have to do, but
no moreunderstand what to do and whyknow and respect the traps!
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###ÿÿ#####ÿ#ÿÿd#########d#########²###STRAINING MANEUVERS: STRAINING MANEUVERS INCREASE G TOLERANCE BY REDUCING B LOOD POOLING IN THE EXTREMITIES AND ABDOMEN, AD BY INCREASING INTRATHORACIC PRESSURE RHYTHMICALLY TO ASSIST THE HEART IN MAINTAINING HEAD LEVEL BLOOD PRESSURE. THE M-1 MANEUVER CONSISTS OF TIGHTENING THE MUSCLES OF THE EXTREMITIES, ABDOMEN, AND CHEST; PULLING THE HEAD DOWN BETWEEN THE SHOULDERS; AND GRUNTING AGAINST A PARTIALLY CLOSED GLOTTIS. THIS GRUNT I S MAINTAINED FOR ABOUT 3 TO 5 SECS, RELAX VERY BRIEFLY TO ALLOW INHALATION AD THORACIC VENOUS BLOOD RETURN, AND THE REPEATED. A PROPERLY PERFORMED M-1 INCREASES G TOLERANCE BY ABOUT 2 G AND IS ROUGHLY ADDITIVE TO THE G SUIT PROTECTION, TOGETHER PROVIDING ABOUT 3 G ADDITIONAL PROTECTION. AN IMPROPERLY PERFORMED M-1 MAY ACTUALLY REDUCE G TOLERANCE, PROBABLY BY REDUCING CARDIAC RETURN.THE L-1 MANEUVER IS IDENTICAL TO THE M-1 MANEUVER EXCEPT THAT THE GLOTTIS IS COMPLETELY CLOSED INSTEAD OF PARTIALLY CLOSED.

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Ï#ÿÿ ###ÿÿ####Tÿl#ÿÿK#########d#########`###1. tighten all muscles before G onset□Get a Jump on the Gs!□ above 62. deep breath, close glottis (say □hook□) 3. bear down and strain for 3 secondsstrain harder for higher Gs; slack off at lower Gs4. while maintaining continuous muscle strain, rapidly exchange full lung of airit□s hard to inhale under high Gs5. work only as hard as you have to